GROUP 35C

TRACTION CONTROL/ACTIVE STABILITY CONTROL SYSTEM

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FEATURES

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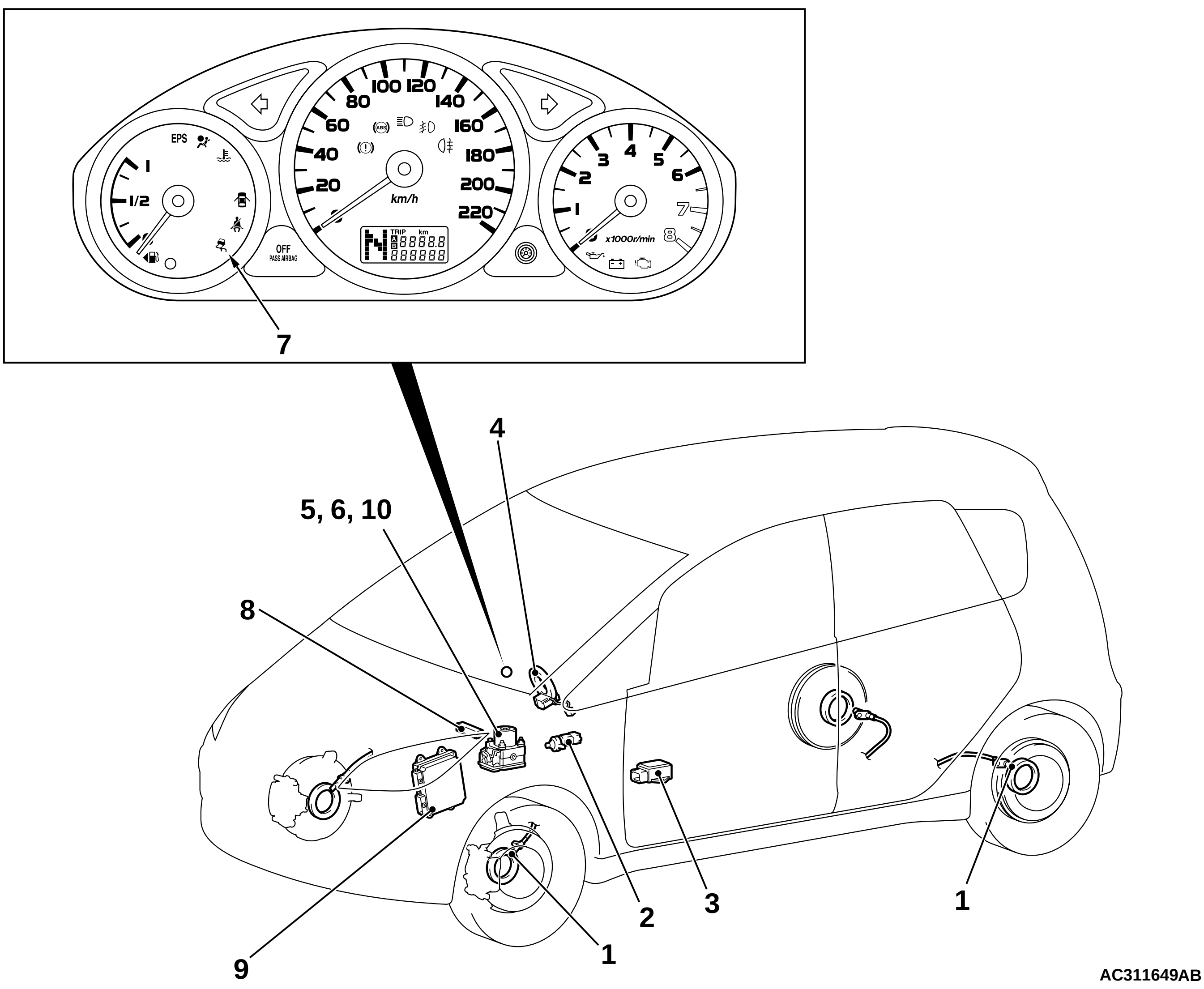
Anti-skid Brake System/Active Stability Control System (ABS/active stability control system) is available for all models as optional equipment.

- The Anti-skid Brake System/Active Stability Control System is a combination system of active stability control system and anti-skid brake control system. The active stability control system avoids a dangerous vehicle attitude by limiting the engine output and braking a set of wheels (left front and right rear, or right front and left rear) according to driving conditions. The anti-skid brake control system prevents wheel spinning at vehicle start.
- Fail-safe function ensures safety is maintained
- Improved serviceability
- To shorten the lines and enhance data transmission reliability, communication with other ECU is performed over a CAN (Controller Area Network).

NOTE: For further details on CAN communication, refer to GROUP 54C, CAN P.54C-2.

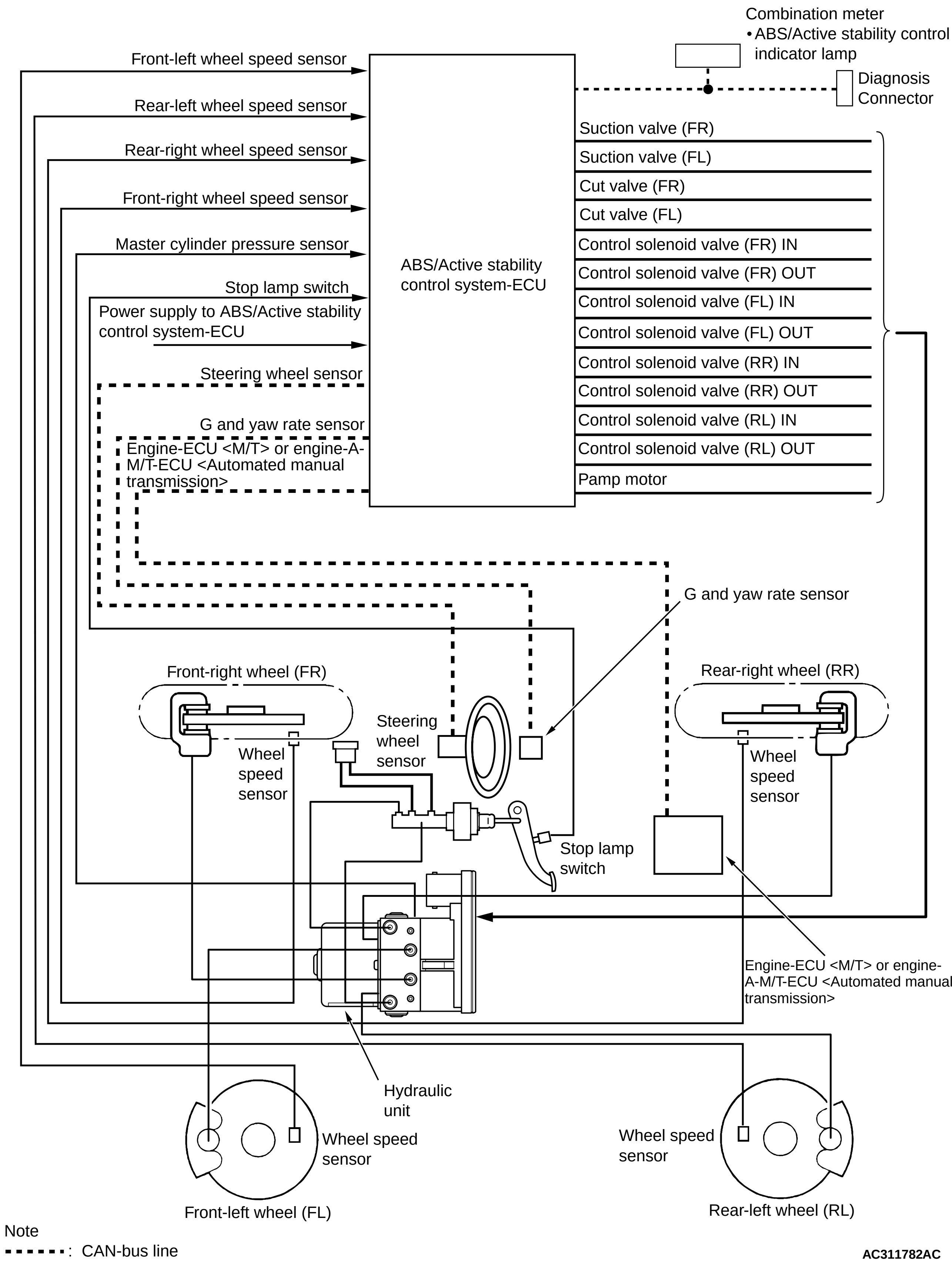
NOTE: On vehicles with active stability control system, the ABS/active stability control system-ECU controls ABS as well.

CONSTRUCTION DIAGRAM



Component		No.	Function
Sensor	Wheel speed sensor	1	Sends alternating current signals at frequencies which are proportional to the rotation speeds of each wheel to the ABS/active stability control system-ECU.
	Stop lamp switch	2	Sends a signal to the ABS/active stability control system-ECU to indicate whether the brake pedal is depressed or not.
	G and yaw rate sensor	3	Detects the lateral acceleration and the yaw rate for the vehicle. Then it sends a signal through the CAN bus line to the ABS/active stability control system-ECU.
	Steering wheel sensor	4	Detects the steering wheel angle, and sends a signal to the ABS/active stability control system-ECU through the CAN bus line.
	Pressure sensor	5	Is incorporated in the hydraulic unit, and informs the ABS/active stability control system-ECU of the brake fluid pressure in the master cylinder.
Actuator	Hydraulic unit	6	Drives the solenoid valves and pamp motor according to signals from the ABS/active stability control system-ECU in order to control the brake hydraulic pressure for each wheel.
	Anti-skid Brake/Active stability control indicator lamp	7	Receives a signal from the ABS/active stability control system-ECU, and flashes to inform the driver that the system is operating, or illuminates to inform the driver of system shutdown.
Diagnosis connector		8	Sets the diagnosis codes and allows communication with the MUT-III.
Engine automated manual transmission electronic control unit (Engine-A-M/T-ECU) <Automated manual transmission>		9	Receives a signal from the ABS/active stability control system-ECU to control the engine output.
Engine-ECU <M/T>		9	Receives a signal from the ABS/active stability control system-ECU to control the engine output.
Anti-skid Brake/Active Stability Control System control unit (ABS/active stability control system-ECU)		10	Controls actuators (described above) based on the signals coming from each sensor.
			Controls the self-diagnostics and fail-safe functions.
			Controls the diagnostic function (MUT-III compatible).

SCHEMATIC DIAGRAM

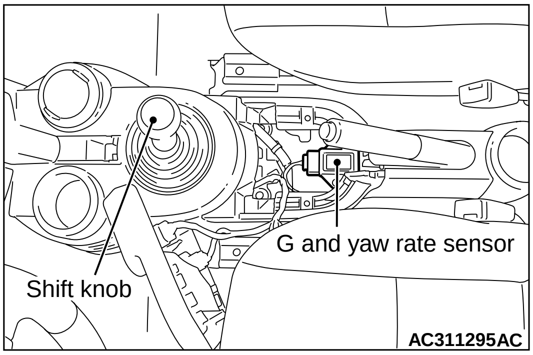


CONSTRUCTION DESCRIPTION

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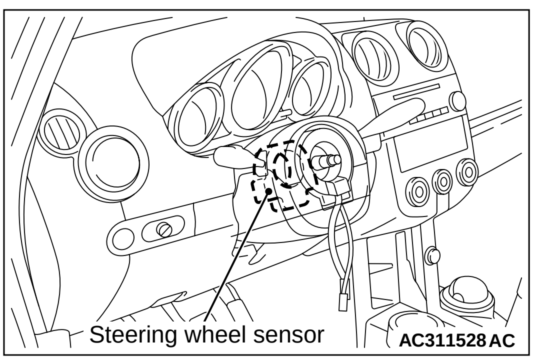
SENSOR

G AND YAW RATE SENSOR



This sensor is installed under the center console, and detects lateral acceleration, yaw rate of the vehicle.

STEERING WHEEL SENSOR



This sensor is mounted behind the column switch, and detects the steering wheel position.

ACTUATOR

HYDRAULIC UNIT

The hydraulic unit includes a cut valve, pressure relief valve, suction valve, suction damper and pressure sensor for the active stability control system additionally, compared with the conventional hydraulic unit for the ABS control.

NOTE: For the internal hydraulic circuit of the hydraulic unit, refer to P.35C-16.

ANTI-SKID CONTROL/ACTIVE STABILITY CONTROL SYSTEM OPERATION INDICATOR LAMP

The Anti-skid control/Active stability control system operation indicator lamp illuminate or flash under the conditions below to inform the driver.

ANTI-SKID CONTROL/ACTIVE STABILITY CONTROL SYSTEM INDICATOR LAMP

- When the active stability control is active, the lamp flashes.
- When the anti-skid control is active, the lamp flashes.
- When there is a failure in the anti-skid control/active stability control system, the lamp illuminates.

ANTI-SKID CONTROL/ACTIVE STABILITY CONTROL SYSTEM OPERATION INDICATOR LAMP AND THEIR OPERATION PATTERN

Condition		Anti-skid control/Active stability control system operation indicator lamp
Normal	Bulb check	Illuminates for three seconds after the ignition is on.
	Normal	–
	Active stability control is active	Flashes at a frequency.
	Anti-skid control is active	Flashes at a frequency.
	ABS/active stability control system-ECU is warning the driver that the active anti-skid control will be disabled to protect the solenoid valve.	Illuminates
	Active stability control is disabled to protect the solenoid valve.	Illuminates

Condition		Anti-skid control/Active stability control system operation indicator lamp
Defective	Active stability control is defective.	Illuminates
	Anti-skid control is defective.	Illuminates
MUT-III is connected	Communicate with some ECU (includes active stability control system)	Illuminates
	No communication	–

ABS/active stability control system-ECU

The ECU incorporates the ABS-ECU and active stability control-ECU. The integral design allows joint operation of the ABS/active stability control system-ECU with the ABS and coordinated control of the driving force and braking force.

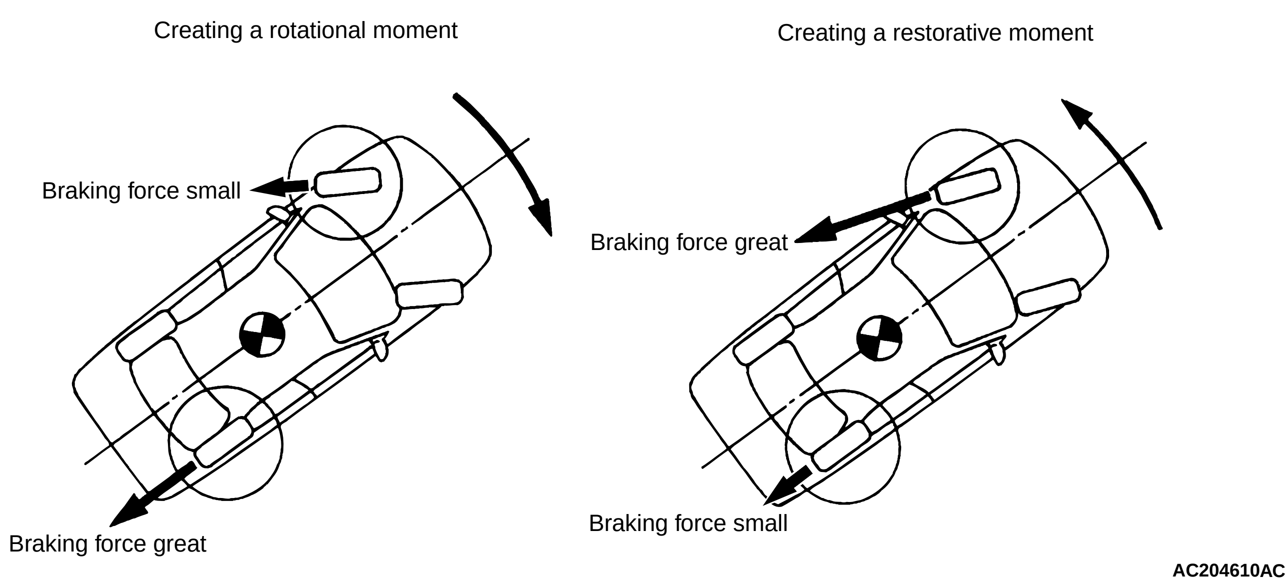
SYSTEM CONFIGURATION

The anti-skid control and Active Stability Control (ABS/active stability control system) System is a system that adds a G and yaw rate sensor, a steering wheel sensor and master cylinder pressure sensor (incorporated in hydraulic unit) to the ABS system.

OVERVIEW OF CONTROL

The ABS/active stability control system-ECU detects vehicle movement based on information from various sensors and calculates a model of ideal vehicle movement. After comparing actual and ideal movements, it acts to bring the actual vehicle movement closer to the ideal model by controlling specific wheel brake force and governing engine output. It restrains under-steering and over-steering through a corrective yaw moment, as explained on the following pages.

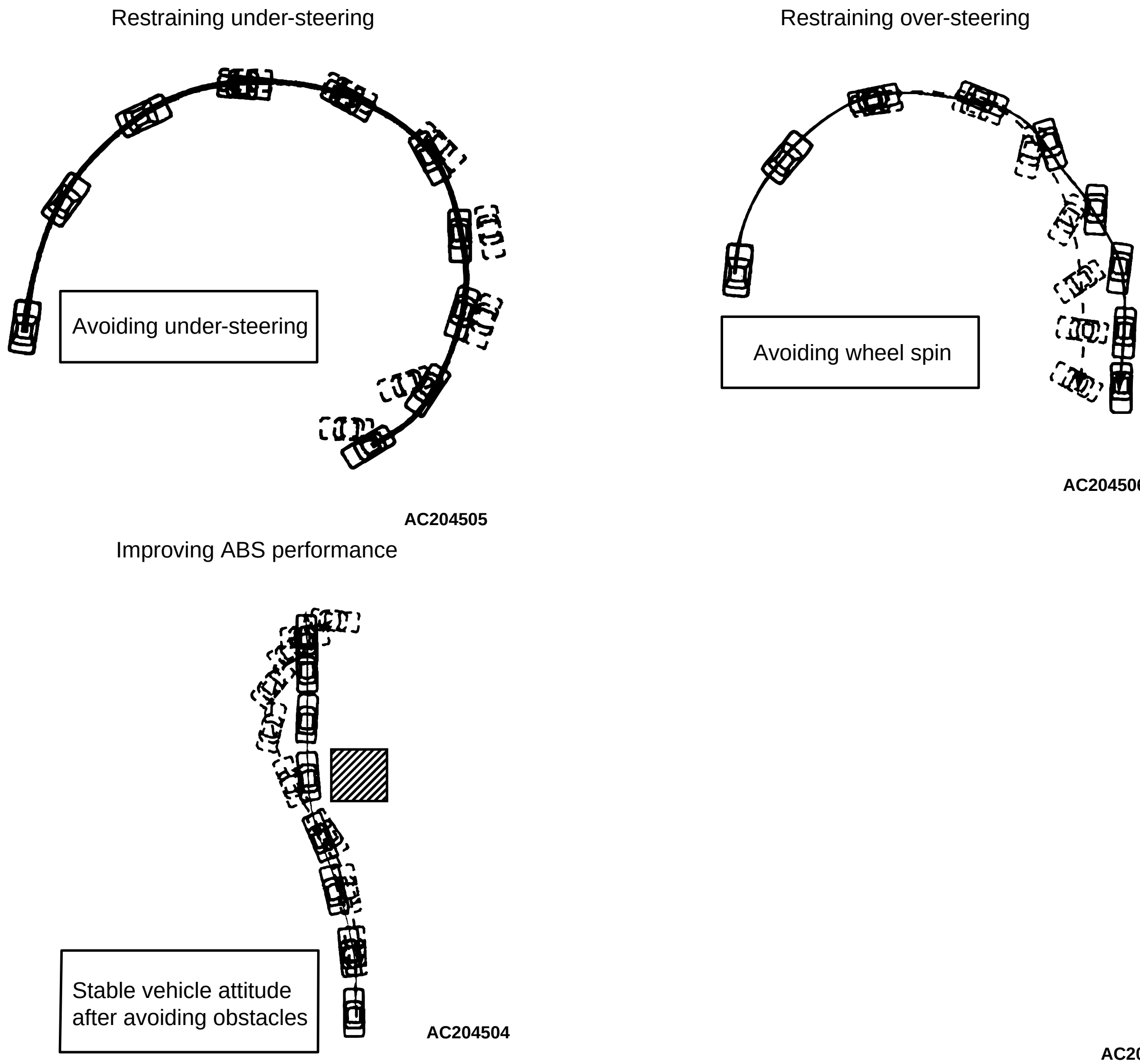
EXAMPLE OF ACTIVE STABILITY CONTROL OPERATION



The Active Stability Control manages the vehicle attitude by creating a yaw moment from altering the balance between the cornering force and each wheel's braking mechanism.

For example, on a slippery surface, if the vehicle tends to be under-steered contrary to the driver's intention, a yaw moment (a rotational moment) is created to restrain the under-steering by increasing the rear-inside braking force. On the other hand, when the vehicle tends to be over-steered, a yaw moment (a restorative moment) is created to restrain the over-steering by increasing the front-outside braking force. Furthermore, when it is determined that the vehicle is over-speeding, safe and stable cornering is enabled by deceleration from restricting engine output.

EXAMPLE OF THE EFFECT OF CONTROL



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JOINT CONTROL

The Active Stability Control transmits data necessary for control of the ABS, performing joint control.

Control system	Control content
ABS	Even during ABS operation, ABS performance is improved from the joint operation of the ABS control.

EXAMPLE OF OPERATION OF ANTI-SKID CONTROL

The anti-skid control prevents brake force loss during slipping of the drive wheels by automatically applying the brakes and sending engine torque reduction signal to the engine. Engine-A-M/T-ECU or engine-ECU when the drive wheels slip or when driving on partly low-friction surfaces.

FAIL-SAFE AND DIAGNOSTIC FUNCTIONS

The ABS/active stability control system-ECU regularly monitors input and output signals. If an error is detected in the system, the ECU sends a fail signal and the active stability control system and/or ABS indicator lamp is illuminated or blinks. Various controls are processed depending on the cause of malfunction as shown below. When the ABS system

fails, the ABS/active stability control system system is also suspended. However, when the only ABS/active stability control system system fails, no other systems are suspended. The appropriate indicator lamps are illuminated.
The ABS/active stability control system-ECU includes the following functions to make system inspection easier.

- Diagnosis code
- Displays Data list
- Actuator test

All of the above operations can be carried out using the MUT-III.

FAIL-SAFE FUNCTION

ABS/active stability control system-ECU

Diagnosis code No.	Item	ABS	EBD	Active stability control	
				Control by engine output	Control by braking force
C1200	Wheel speed sensor (FR) system (open or short to earth or power supply)	Control disabled	EBD disabled if at least three wheels fail	Control disabled	Control disabled
C1205	Wheel speed sensor (FL) system (open or short to earth or power supply)				
C1210	Wheel speed sensor (RR) system (open or short to earth or power supply)				
C1215	Wheel speed sensor (RL) system (open or short to earth or power supply)				
C1201	Wheel speed sensor (FR) system (sensor transmitting error)	Control disabled	EBD disabled if at least three wheels fail	Control disabled	Control disabled
C1206	Wheel speed sensor (FL) system (sensor transmitting error)				
C1211	Wheel speed sensor (RR) system (sensor transmitting error)				
C1216	Wheel speed sensor (RL) system (sensor transmitting error)				

Diagnosis code No.	Item	ABS	EBD	Active stability control	
				Control by engine output	Control by braking force
C1226	Control solenoid valve (FR) pressure holding system	Control disabled	Control disabled	Control disabled	Control disabled
C1231	Control solenoid valve (FR) decompressing system				
C1236	Control solenoid valve (FL) pressure holding system				
C1241	Control solenoid valve (FL) pressure reducing system				
C1246	Control solenoid valve (RR) pressure holding system				
C1251	Control solenoid valve (RR) pressure reducing system				
C1256	Control solenoid valve (RL) pressure holding system				
C1261	Control solenoid valve (RL) decompressing system				
C1271	Motor system	Control disabled	Backup control	Control disabled	Control disabled
C1276	Valve relay system	Normal control	Normal control	Control disabled	Control disabled
C1300	Front-right cut valve (Primary)	Control disabled	Control disabled	Control disabled	Control disabled
C1305	Front-right suction valve (Primary)				
C1310	Front-left cut valve (secondly)				
C1315	Front-left suction valve (secondly)				
C1340	Abnormal stop lamp switch signal	Normal control	Normal control	Control disabled	Control disabled
C1361	Abnormal pressure sensor characteristics	Normal control	Normal control	Normal control	Normal control
C1364	Pressure sensor malfunction	Normal control	Normal control	Normal control	Normal control
C1366	Lateral G sensor signal malfunction	Normal control	Normal control	Control disabled	Control disabled

Diagnosis code No.	Item	ABS	EBD	Active stability control	
				Control by engine output	Control by braking force
C1371	Yaw late sensor signal malfunction	Normal control	Normal control	Control disabled	Control disabled
C1377	Sensor cluster communication abnormality	Normal control	Normal control	Control disabled	Control disabled
C1394	Steering wheel sensor neutral point not learned	Normal control	Normal control	Control disabled	Control disabled
C1505	Steering wheel sensor abnormality (detected at ABS/active stability control system-ECU-side)	Normal control	Normal control	Control disabled	Control disabled
C1506	Steering wheel sensor abnormality (self-detection at steering wheel sensor-side)				
C1607	ABS/active stability control system-ECU failure	Control disabled	Control disabled	Control disabled	Control disabled
	ABS/active stability control system-ECU failure (abnormal supply voltage to sensor)	Control disabled	Normal control	Control disabled	Control disabled
	ABS/active stability control system-ECU failure (CAN communication malfunction)	Normal control	Normal control	Control disabled	Control disabled
	ABS/active stability control system-ECU failure (EEPROM writing impossible)	Normal control	Normal control	Control disabled	Control disabled
C1640	Improperly installed ABS/active stability control system-ECU	Control disabled	Control disabled	Control disabled	Control disabled
C1860	High voltage at ABS/active stability control system-ECU power supply (18.0±1.0V or more)	Control disabled	Control disabled	Control disabled	Control disabled

Diagnosis code No.	Item	ABS	EBD	Active stability control	
				Control by engine output	Control by braking force
C1861	Low voltage at ABS/active stability control system-ECU power supply (9.7±0.3V or less, 8.0±0.5V or more)	Control disabled	Normal control	Control disabled	Control disabled
	ABS/active stability control system-ECU power supply low voltage (8.0±0.5 V or below)<when vehicle stopped>	Control disabled	Normal control	Control disabled	Control disabled
C1864	Steering wheel sensor neutral point not learned	Control disabled	Normal control	Control disabled	Control disabled
U1073	Bus-off	Control disabled	Normal control	Control disabled	Control disabled
U1100	Engine-related CAN Timeout error	Normal control	Normal control	Control disabled	Control disabled
U1101*	A/T-related CAN Timeout error	Normal control	Normal control	Control disabled	Control disabled
U1104	Steering wheel sensor CAN Timeout error	Normal control	Normal control	Control disabled	Control disabled
U1120	Engine malfunction detected	Normal control	Normal control	Control disabled	Control disabled

*NOTE: *: A/T only*

STEERING WHEEL SENSOR

Diagnosis code No.	ECU monitors:	ABS	EBD	Active stability control	
				Control by engine output	Control by braking force
C1551	Improper output voltage of steering wheel sensor	Normal control	Normal control	Control disabled	Control disabled
C1552	Abnormal steering wheel sensor output pattern				
C1553	Abnormal optical sensor output pattern				
C1554	Steering wheel sensor speed is out of range				
C1555	Steering wheel sensor out of range				
C1608	EEPROM failure	Normal control	Normal control	Control disabled	Control disabled
U1073	Bus-off	Normal control	Normal control	Control disabled	Control disabled

INDICATOR LAMP AND THEIR OPERATION PATTERN

ABS/active stability control system-ECU

Diagnosis code No.	Item	Brake warning lamp	ABS warning lamp	Anti-skid control system/Active stability control system indicator lamp
C1200	Wheel speed sensor (FR) system (open or short to earth or power supply)	Illuminates if both of the rear wheels are included	Illuminates	Illuminates
C1205	Wheel speed sensor (FL) system (open or short to earth or power supply)			
C1210	Wheel speed sensor (RR) system (open or short to earth or power supply)			
C1215	Wheel speed sensor (RL) system (open or short to earth or power supply)			
C1201	Wheel speed sensor (FR) system (sensor transmitting error)	Illuminates if both of the rear wheels are included	Illuminates	Illuminates
C1206	Wheel speed sensor (FL) system (sensor transmitting error)			
C1211	Wheel speed sensor (RR) system (sensor transmitting error)			
C1216	Wheel speed sensor (RL) system (sensor transmitting error)			
C1226	Control solenoid valve (FR) pressure holding system	Illuminates	Illuminates	Illuminates
C1231	Control solenoid valve (FR) decompressing system			
C1236	Control solenoid valve (FL) pressure holding system			
C1241	Control solenoid valve (FL) pressure reducing system			
C1246	Control solenoid valve (RR) pressure holding system			
C1251	Control solenoid valve (RR) pressure reducing system			
C1256	Control solenoid valve (RL) pressure holding system			
C1261	Control solenoid valve (RL) decompressing system			
C1271	Motor system	off	Illuminates	Illuminates
C1276	Valve relay system	Illuminates	Illuminates	Illuminates

Diagnosis code No.	Item	Brake warning lamp	ABS warning lamp	Anti-skid control system/Active stability control system indicator lamp
C1300	Front-right cut valve (Primary)	Illuminates	Illuminates	Illuminates
C1305	Front-right suction valve (Primary)			
C1310	Front-left cut valve (secondly)			
C1315	Front-left suction valve (secondly)			
C1340	Abnormal stop lamp switch signal	off	off	Illuminates
C1361	Abnormal pressure sensor characteristics	off	off	Illuminates
C1364	Pressure sensor malfunction	off	off	Illuminates
C1366	Lateral G sensor signal malfunction	off	off	Illuminates
C1371	Yaw late sensor signal malfunction	off	off	Illuminates
C1377	Sensor cluster communication abnormality	off	Illuminates	Illuminates
C1394	Steering wheel sensor neutral point not learned	Flashes	Flashes	Flashes
C1505	Steering wheel sensor abnormality (detected at ABS/active stability control system-ECU-side)	off	off	Illuminates
C1506	Steering wheel sensor abnormality (self-detection at steering wheel sensor-side)			
C1607	ABS/active stability control system-ECU failure	Illuminates	Illuminates	Illuminates
	ABS/active stability control system-ECU failure (abnormal supply voltage to sensor)	off	Illuminates	Illuminates
	ABS/active stability control system-ECU failure (CAN communication malfunction)	off	Illuminates	Illuminates
	ABS/active stability control system-ECU failure (EEPROM writing impossible)	off	Illuminates	Illuminates
C1640	Improperly installed ABS/active stability control system-ECU	off	Illuminates	Illuminates
C1860	High voltage at ABS/active stability control system-ECU power supply (18.0±1.0V or more)	Illuminates	Illuminates	Illuminates

Diagnosis code No.	Item	Brake warning lamp	ABS warning lamp	Anti-skid control system/Active stability control system indicator lamp
C1861	Low voltage at ABS/active stability control system-ECU power supply (9.7±0.3V or less, 8.0±0.5V or more)	off	Illuminates	Illuminates
	ABS/active stability control system-ECU power supply low voltage (8.0±0.5 V or below)<when vehicle stopped>	Illuminates	Illuminates	Illuminates
C1864	Steering wheel sensor neutral point not learned	off	off	Illuminates
U1073	Bus-off	off	Illuminates	Illuminates
U1100	Engine-related CAN Timeout error	off	Illuminates	Illuminates
U1101*	A/T-related CAN Timeout error	off	Illuminates	Illuminates
U1104	Steering wheel sensor CAN Timeout error	off	Illuminates	Illuminates
U1120	Engine malfunction detected	off	off	Illuminates

*NOTE: *: A/T only*

STEERING WHEEL SENSOR

Diagnosis code No.	Inspection item	Brake warning lamp	ABS warning lamp	Anti-skid control system/Active stability control system indicator lamp
C1551	Improper output voltage of steering wheel sensor	off	off	Illuminates
C1552	Abnormal steering wheel sensor output pattern	off	off	Illuminates
C1553	Abnormal optical sensor output pattern	off	off	Illuminates
C1554	Steering wheel sensor speed is out of range	off	off	Illuminates
C1555	Steering wheel sensor out of range	off	off	Illuminates
C1608	EEPROM failure	off	off	Illuminates
U1073	Bus-off	off	off	Illuminates

DIAGNOSIS CODE READING PROCEDURE

The diagnosis function encompasses 41 items<ABS/active stability control system> and 7 items<steering wheel sensor>, and the diagnosis codes can be read using the MUT-III (Refer to Workshop Manual).

DIAGNOSIS CODE MEMORY ERASING PROCEDURE

Diagnosis codes can be cleared from memory by using the MUT-III (Refer to Workshop Manual).

DATA LIST OUTPUT

Among the ABS/active stability control system-ECU input data, the following items can be read by using MUT-III*.

*NOTE: *: For MUT-III, use the ABS system data list.*

MUT-III display*	Item No.	Check item	Display or unit
FR wheel speed sensor	01	Front-right wheel speed sensor	km/h
FL wheel speed sensor	02	Front-left wheel speed sensor	km/h
RR wheel speed sensor	03	Rear-right wheel speed sensor	km/h
RL wheel speed sensor	04	Rear-left wheel speed sensor	km/h
Battery voltage	05	ABS/active stability control system-ECU power supply voltage	V
Stoplamp switch	06	Stop lamp switch	ON/OFF
Straight G sensor	30	G and yaw rate sensor	G
Lateral G sensor	31	G and yaw rate sensor	G
Steering angle	32	Steering wheel sensor	deg
Yaw rate sensor	33	G and yaw rate sensor	deg/s
Master cylinder pressure	34	Master cylinder pressure sensor	bar/Fail

ACTUATOR TEST

Solenoid valves can be activated forcibly by using MUT-III. In addition, the air bleeding mode for the active stability control system is set.

The actuator test is suspended when the ABS/active stability control system system fails.

*NOTE: *: For MUT-III, use the ABS system data list.*

ACTUATOR TEST SPECIFICATIONS

MUT-III display*	Item No.	Check item	Parts to be activated
FR wheel ABS Drive	01	Solenoid valve for front-right wheel	Solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
FL wheel ABS Drive	02	Solenoid valve for front-left wheel	
RR wheel ABS Drive	03	Solenoid valve for rear-right wheel	
RL wheel ABS Drive	04	Solenoid valve for rear-left wheel	
FR wheel ABS Drive	05	Control solenoid valve for front-right wheel	Control solenoid valves and pump motors in the hydraulic unit (simple inspection mode)
FL wheel ABS Drive	06	Control solenoid valve for front-left wheel	
RR wheel ABS Drive	07	Control solenoid valve for rear-right wheel	
RL wheel ABS Drive	08	Control solenoid valve for rear-left wheel	
Engine ABS drive	09	ABS system operation check	Sends the engine torque control signal (engine torque = 0) to engine-A/T-ECU or engine-ECU for three seconds

CALIBRATION

When the G and yaw late sensor and the steering wheel sensor are replaced with new ones, calibrate them respectively by using MUT-III*.

*NOTE: *: For MUT-III, use the ABS system data list.*

CALIBRATION SPECIFICATIONS

MUT-III display*	Item No.	Check item	Parts to be activated
Lateral G sensor Calibration	–	Calibration of the G and yaw rate sensor	–
Steering wheel sensor Calibration	–	Calibration of the steering wheel sensor	–

SYSTEM OPERATION

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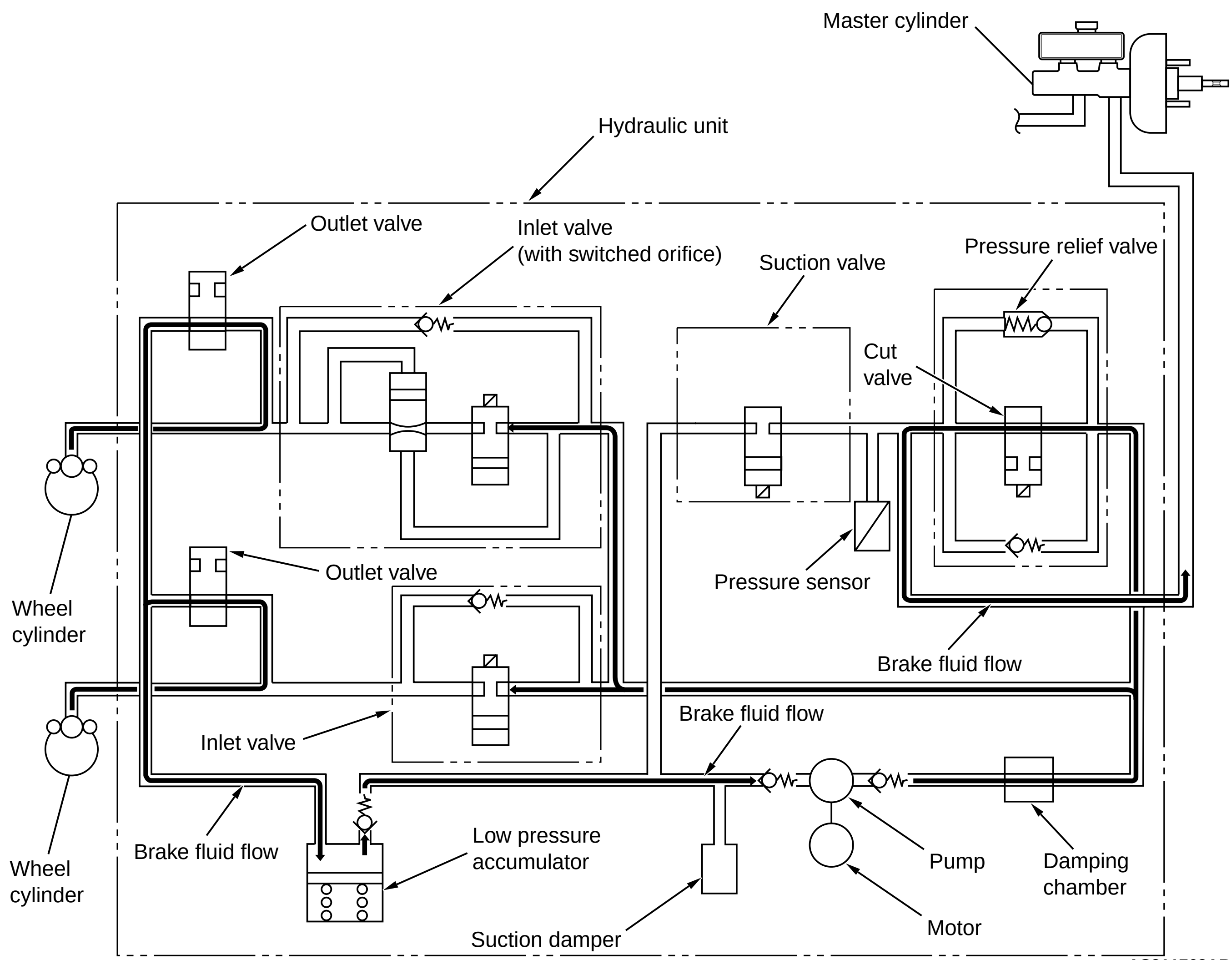
ACTIVE STABILITY CONTROL SYSTEM OPERATION

The ABS/active stability control system-ECU receives information from the engine automated manual transmission electronic control unit(engine-A-M/T-ECU) <Automated manual transmission> or engine-ECU <M/T>, the steering wheel sensor, the G and yaw-rate sensor and the wheel speed sensor. If the ECU determines that the vehicle is tending to oversteer or understeer, it sends signals to the active stability control system valves and the ABS solenoid valves to increase the fluid pressure to the wheels.

The system closes the cut valve to shut the fluid channel to the suction valve, and activates the pump motor. The brake fluid, which is pumped through the low pressure accumulator, will be supplied to the front left wheel during oversteering or the rear right wheel during understeering when the vehicle is at right turn.

The ABS/active stability control system-ECU communicates with the engine-A-M/T-ECU <automated manual transmission> or the engine-ECU <M/T> via CAN-bus lines, and the system controls the engine if the accelerator pedal is depressed excessively.

DURING NORMAL BRAKING AND WHEN THE ABS FLUID PRESSURE IS DECREASING

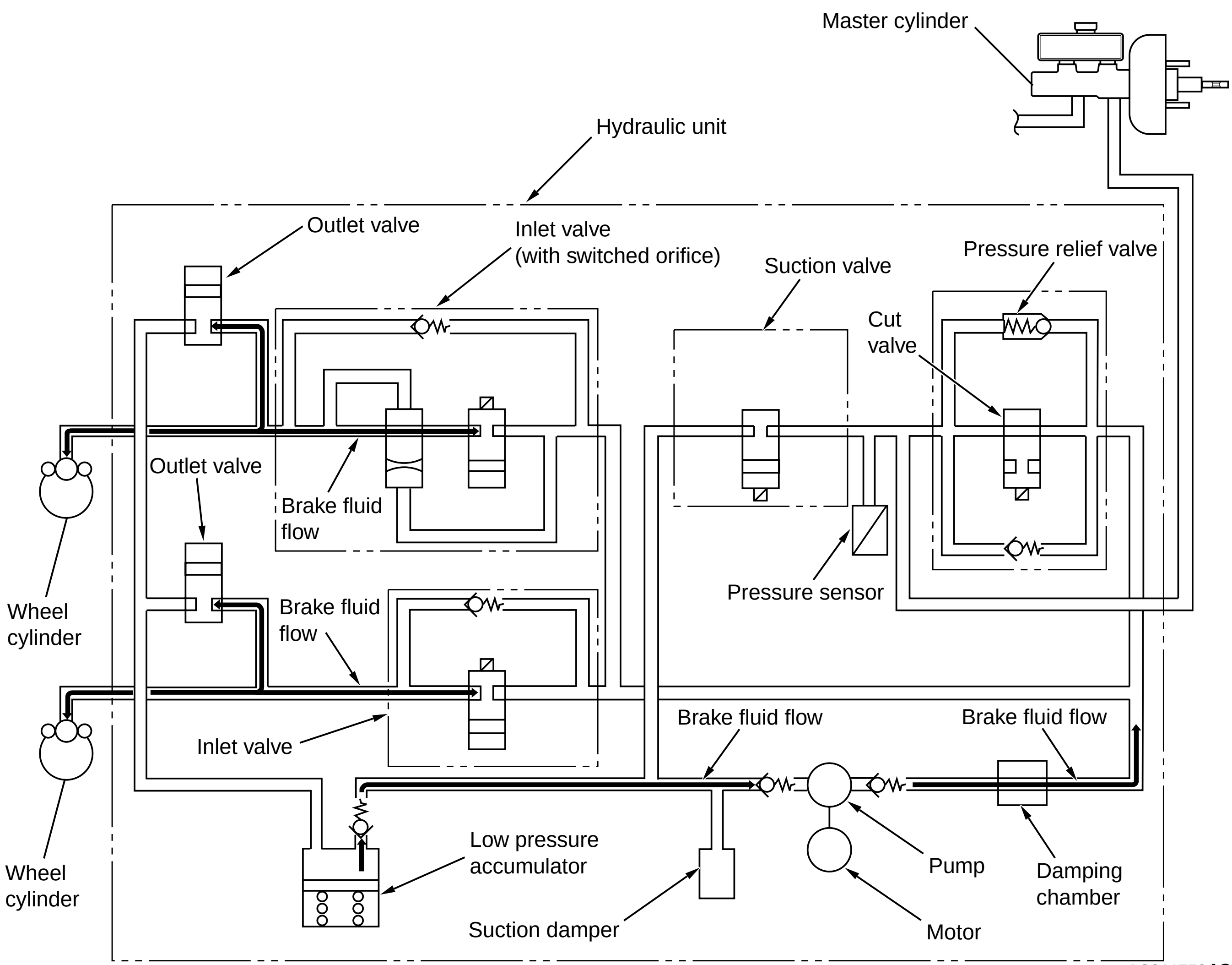


Fluid pressure from the wheel cylinder is stored in the low pressure accumulator via the outlet valve, then, the brake fluid stored in the low pressure accumulator is returned to the master cylinder by the motor driven pump.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		OFF	Closed
Suction valve		OFF	Open
Solenoid valve	IN	OFF	Open
	OUT	OFF	Closed

WHEN THE ABS FLUID PRESSURE IS HOLDING

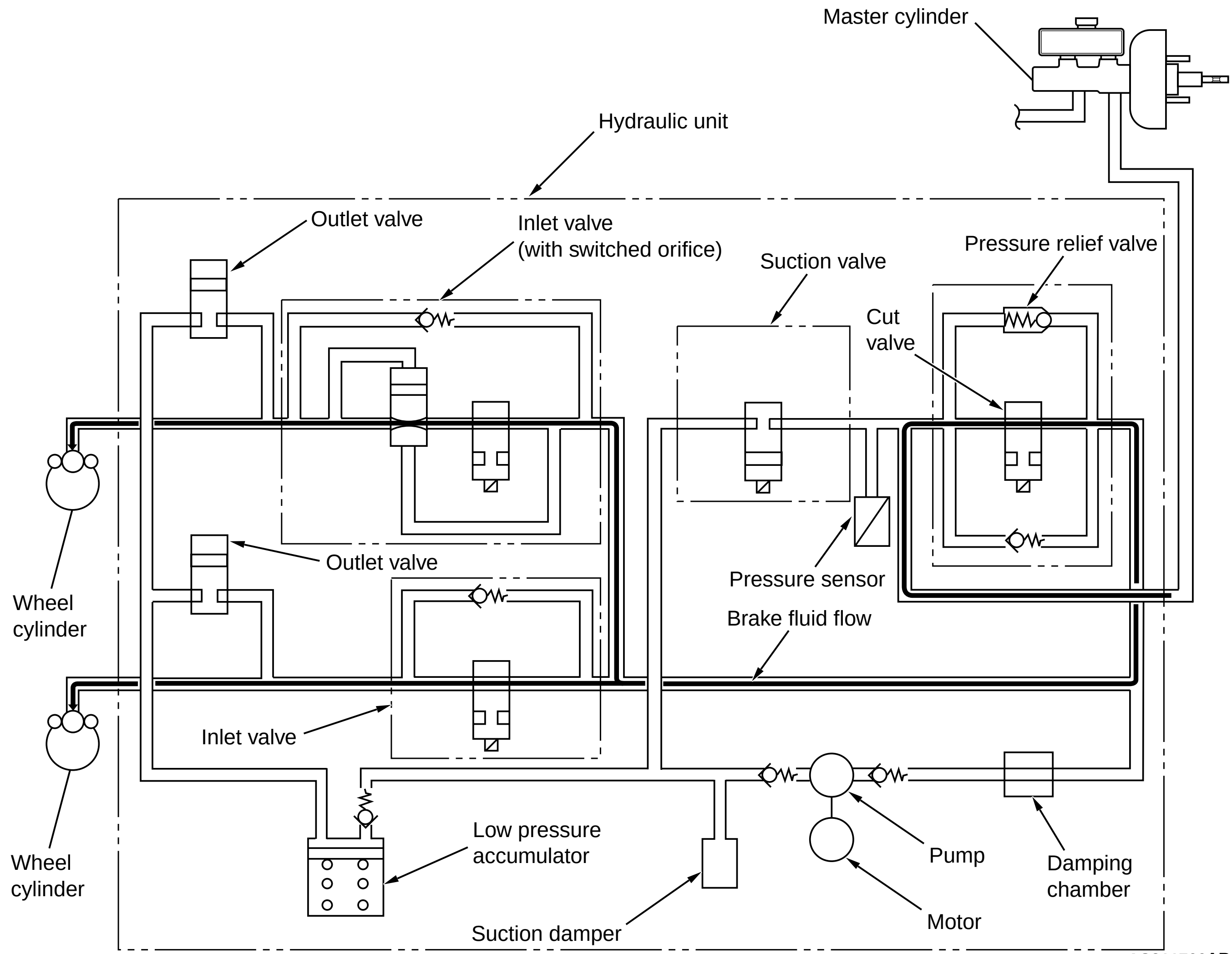


The system closes the inlet solenoid valve and the outlet solenoid valve to hold the brake fluid pressure in the wheel cylinders. The brake fluid stored in the low pressure accumulator is returned to the master cylinder by the motor driven pump.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		OFF	Open
Suction valve		OFF	Closed
Solenoid valve	IN	ON	Closed
	OUT	OFF	Closed

WHEN THE ABS FLUID PRESSURE IS INCREASING



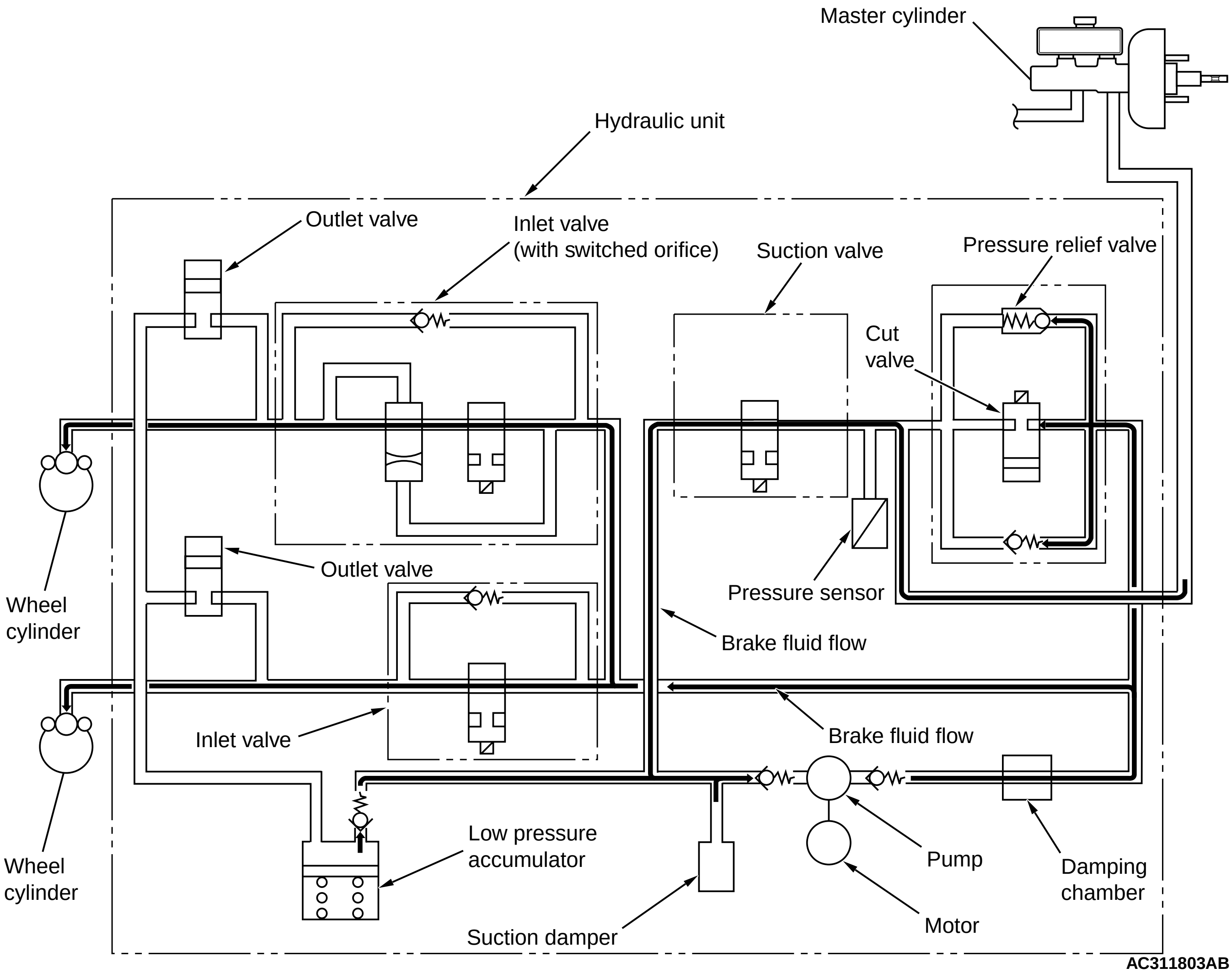
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The system opens the inlet solenoid valve and closes the outlet solenoid valve to increase the brake fluid pressure in the wheel cylinders.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		ON	Open
Suction valve		OFF	Closed
Solenoid valve	IN	OFF	Open
	OUT	OFF	Closed

WHEN THE ACTIVE STABILITY CONTROL IS INCREASING FLUID PRESSURE

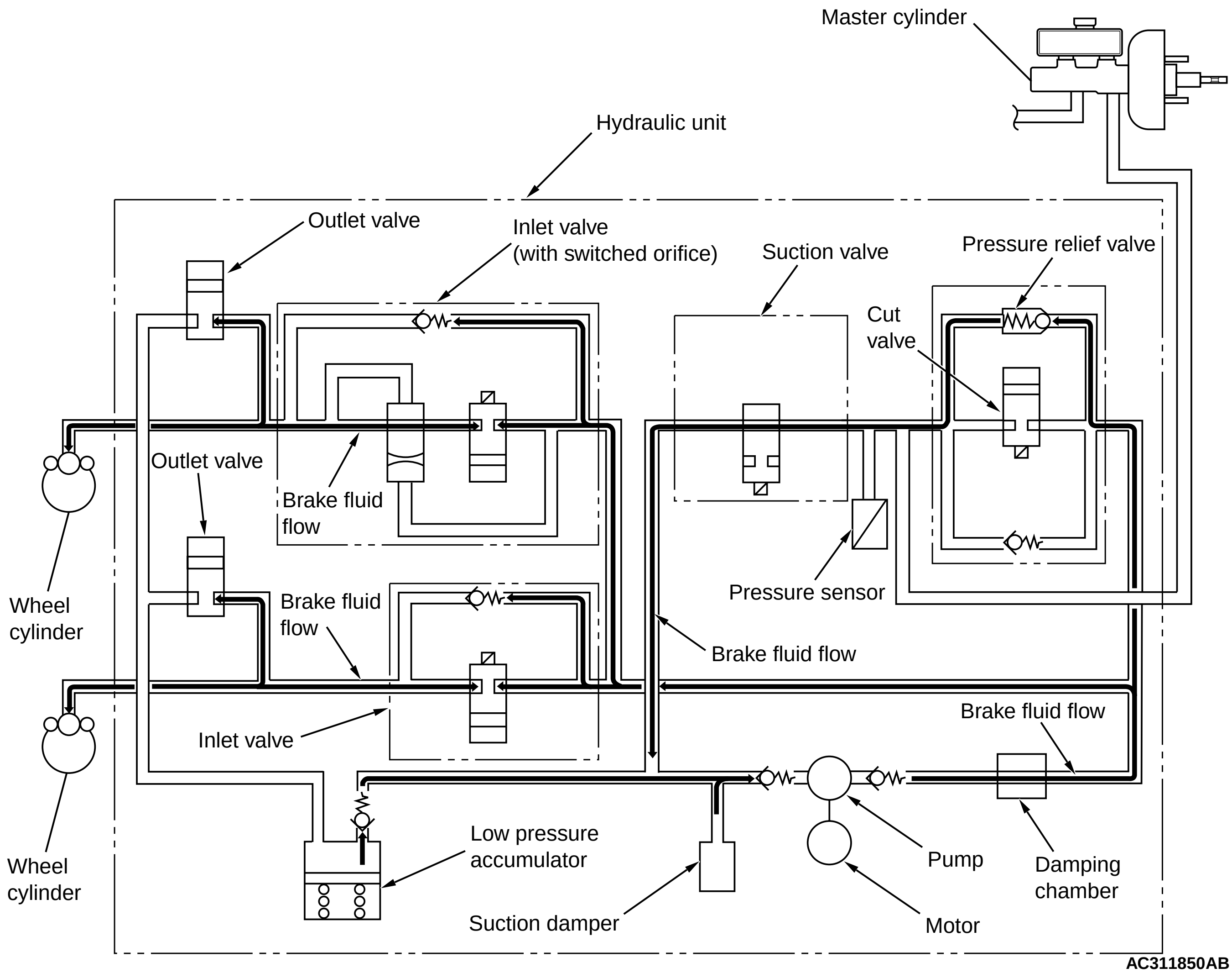


The system closes the cut valve to shut the fluid channel from the master cylinder. The brake fluid, which is pumped from the low pressure accumulator, is supplied to the wheel cylinders.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		OFF	Closed
Suction valve		OFF	Open
Solenoid valve	IN	OFF	Open
	OUT	OFF	Closed

WHEN THE ACTIVE STABILITY CONTROL IS HOLDING FLUID PRESSURE

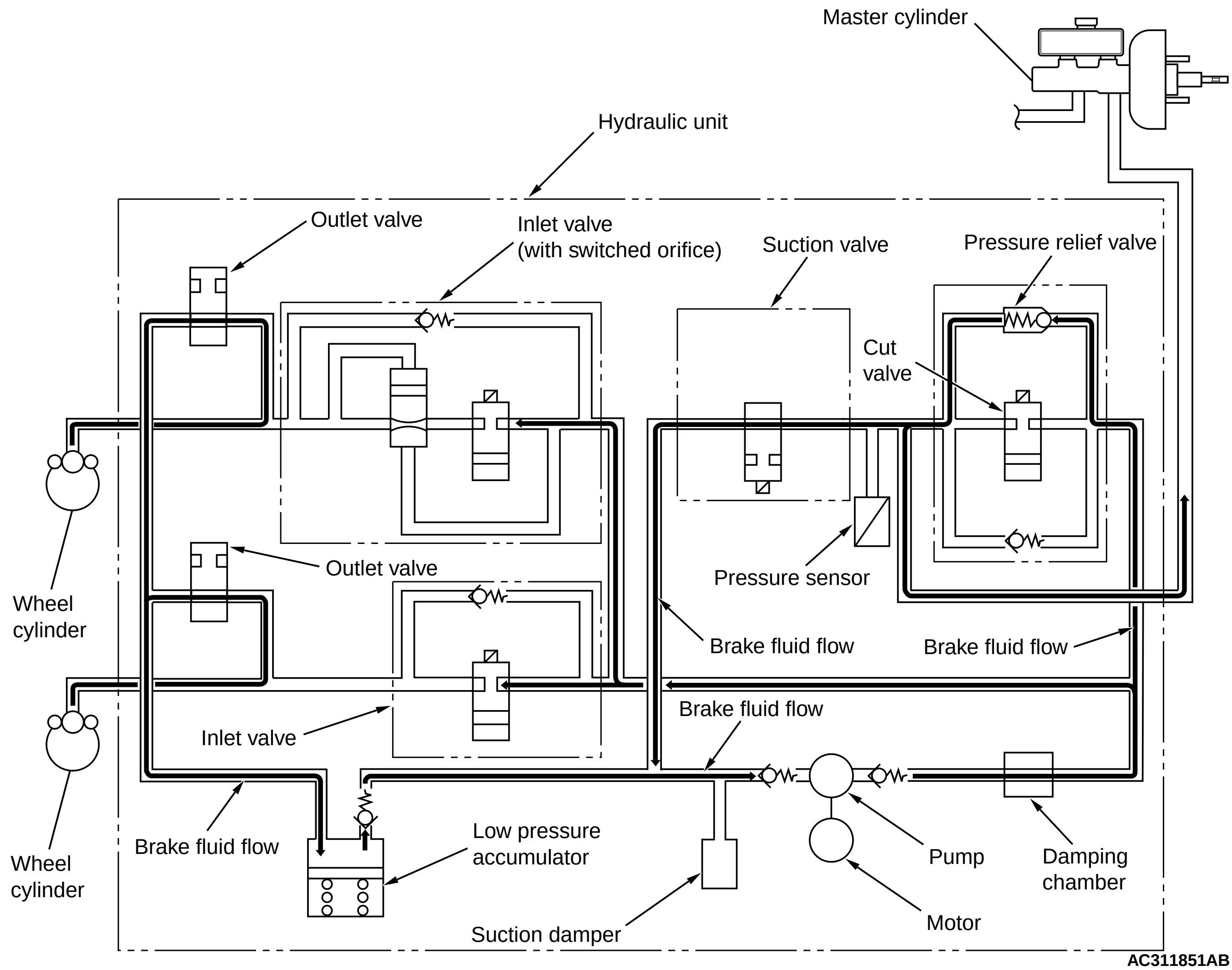


The system closes the inlet and outlet valves to hold the fluid pressure in the wheel cylinders. The brake fluid stored in the low pressure accumulator is extracted by the motor driven pump, and circulated back to the pump itself without flowing in the suction valve and cut valve.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		ON	Open
Suction valve		OFF	Closed
Solenoid valve	IN	ON	Closed
	OUT	OFF	Closed

WHEN THE ACTIVE STABILITY CONTROL IS DECREASING FLUID PRESSURE



The system closes the inlet valve and opens the outlet valve. The brake fluid stored in the low pressure accumulator is extracted by the motor driven pump, and circulated back to the pump itself without flowing in the suction valve and cut valve.

STATUS OF THE OPERATION VALVE

Item		Energisation	Open/Close
Cut valve		ON	Open
Suction valve		OFF	Closed
Solenoid valve	IN	ON	Closed
	OUT	OFF	Closed

ANTI-SKID CONTROL SYSTEM OPERATION

The ABS/active stability control system-ECU receives information from the engine-A-M/T-ECU <Automated manual transmission> or engine-ECU <M/T>, the G and yaw-rate sensor, and the wheel speed sensor. If the ECU determines that a road wheel is spinning, it will control the fluid pressure to the spinning wheel to apply torque to the other road wheels. The operations of the ABS solenoid valves and the active stability control system valves are the same as for the active stability control system. The ABS/active stability control system-ECU communicates with the engine-A-M/T-ECU <automated manual transmission> or the engine-ECU <M/T> via CAN-bus lines, and the system controls the engine if the accelerator pedal is depressed excessively.